PATENT SPECIFICATION (11) 1 372 879

1 372 879

(21) Application No. 47689/71 (22) Filed 13 Oct. 1971 (19)

(31) Convention Application No. 80395 (32) Filed 13 Oct. 1970 in

(33) United States of America (US)

(44) Complete Specification published 6 Nov. 1974

(51) International Classification B01D 21/02

(52) Index at acceptance

B1D 1A 1E 1G 2J1C3 7B3A
A4N 2E 8C 8G1 8G2
F2V E1B F6B

(54) SKIMMER ASSEMBLY

(71) I, GIORA ERLICH, a citizen of Israel, residing at 8 Solond Road, Monsey, New York, in the United States of America, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a tank through which liquid is drawn off from a reservoir, more particularly to a swimming pool skimmer assembly.

Swimming pools are usually equipped with skimmers to clean and maintain the water surface free from floating debris. The skimmers are connected to the suction side of a water filtration and circulation system comprising a pump, a filter and the appropriate piping which draws the water in through the skimmer, removes debris and particulate contaminants therefrom and returns clean water to the pool.

The skimmers most commonly in use comprise a housing or tank having an inlet passage adapted to receive water from the surface of the pool, and an outlet connected to the suction side of the pump; and a floating weir pivotally mounted on a horizontal axis in the inlet passage to permit entry of only surface water and debris. The weir is responsive to the level of the water in the tank and operates to keep the level constant for any given flow rate. A skimmer system of this type is shown in U.S. Patent No. 2,701,235 to King.

While skimmers of the type described are during normal operation quite effective in cleaning the surface of a pool, they have a serious drawback in that the weir can only operate to maintain a constant level in the tank over a limited range of water levels in the pool. If the water level in the pool drops below the inlet passage or merely below the operative point of the weir because of a leak, evaporation, children splashing, etc., the water will be drained out of the tank and air will be drawn into the skimmer by the suction of the pump. This will in short order cause water circulation to cease and the pump to cavitate. When water is added to raise the level to the normal level the air must be bled from the system before effective water circulation can again commence. This is often a time consuming and frustrating task.

To overcome this difficulty skimmers have been provided with a water by-passage, commonly known as an equalizer line, which communicates the swimming pool at a point below the skimmer inlet passage and the outlet of the skimmer tank. In the event that the water level drops below the inlet passage, the equalizer line carries a sufficient quantity of water to prevent complete drainage of the skimmer tank and starvation of the pump. The equalizer line is normally closed by a check valve so that during normal skimming operation all flow enters the tank via the weir. To further prevent air intake and to facilitate actuation of the check valve, float valves have been provided to close the sump portion of the skimmer tank when the water level drops below the operational point of the weir. When the float valve is closed the pump suction creates a low pressure on the downstream side of the check valve causing it to open and thus maintain continuous flow via the equalizer line. A skimmer system of this type is shown in U.S. Patent No. 3,306,448 to Baker.

Skimmer tanks are usually provided with a removable foraminous basket disposed in a sump portion to retain large particles of debris to prevent their entry into the circulation system. Unfortunately, the float valve in the above-identified patent occupies much of the space normally reserved for the skimmer basket. Accordingly, the tank must be made larger to accommodate both the float valve and the proper size basket. In addition, and more importantly, the float valve assembly in many instances is formed as an integral part of the basket. This increases

the complexity and cost of the skimmer construction. Also, replacement of the skimmer basket often requires replacement of the float valve when in fact float valve replacement is not required. Furthermore, float valves are susceptible to sticking and are often a nuisance to maintain. These factors are of particular concern in the case of above-ground pools, where the need to provide simple, small and inexpensive components is paramount.

By the present invention, it is possible to provide a floating weir skimmer with an automatic shut-off valve having all of the attributes of the float valve described above, but none of the deficiencies. The floating weir of the present invention is adapted to serve the dual purpose of maintaining a constant water level within the skimmer tank during normal operation and closing the tank to prevent air inclusion when the water level in the pool drops below a predetermined point. In this manner unlike prior skimmers the size and complexity of the skimmer need not be increased in order to prevent air inclusion and/or maintain continuous water circulation during periods of low water level in the pool.

According to this invention in one aspect, I provide a tank through which in use liquid is led off from a liquid containing reservoir, having an inlet for liquid from the reservoir, an outlet and a shut-off weir comprising a member floatable in the liquid and pivotally mounted on a horizontal axis for flow of liquid from the inlet over an edge of the weir remote from the axis and responsive to the level of liquid in the tank by pivoting to maintain a level in the tank which is substantially constant for a given liquid level of the reservoir when the level in the reservoir is above a pre-determined level, and to automatically seal against a valve seat in the tank to prevent flow through the tank from the inlet to the outlet when the reservoir level is below the said pre-determined level.

Preferably the said pre-determined level is the inlet passage level.

In another aspect, the invention provides a swimming pool skimmer comprising, in combination, a tank having an inlet passage to receive water and floating debris from the surface of a swimming pool and an outlet to discharge such water; a shut-off valve seat in the tank between the inlet passage and the outlet; and a shut-off weir comprising a plate floatable in the water pivotally mounted on a horizontal axis for flow of water from the inlet over an edge remote from the axis into the tank and responsive to the level of water in the tank by pivoting to maintain a level of water in the tank which is substantially constant for a given level in the pool when the level in the pool is above the inlet passage and to automatically seal against the shut-off valve seat to prevent flow through the tank from the inlet to the outlet when the water level in the pool is below the inlet passage. The closure of the tank prevents air inclusion into a circulation system to which the outlet is, in use, attached.

The shut-off weir preferably comprises a flat plate extending substantially across the inlet passage of the tank, hinged at its lower edge on the horizontal axis, and movable between floating and closed positions, floatable gasket material being attached to the inner face of the plate (the face towards the tank), to bias the plate toward the surface of the water in the inlet passage, so that all flow normally entering the tank passes over the top horizontal edge of the plate. In this manner the weir is responsive to the water level in the tank and thus acts, when the level in the inlet passage is constant, to maintain a constant level in the tank. It also facilitates the skimming action to remove debris from the pool surface. The floatable material also serve as a gasket to seal against the valve seat provided in the tank to close the tank and thus prevent air inclusion when the pool water level drops below the tank inlet passage or the operational limit of the weir. Most resilient rubber and plastic foam materials, such as polyurethane and polystyrene are suitable floatable gasket materials. However, it should be noted that the floatable material may be non-resilient, such as wood or like material and the valve seat in the tank can be provided with a suitable gasket upon which the weir can seal in the closed position.

The tank preferably has a cavity below the inlet passage in which a removable open top strainer basket can be installed to remove and retain large particles of debris from the incoming water, the weir being adapted to effectively shut the opening on the top of the basket in its closed position. This can be accomplished by providing a peripheral lip or ledge in the tank between the inlet passage and the basket cavity which serves as a seat for the weir. Also, the basket can be provided with a flange disposed along the outer periphery at its open end and adapted to rest on a corresponding ledge or step in the tank to hold the basket. Either the flange on the basket or the corresponding step or ledge in the tank may serve as the shut-off valve seat for the weir.

Where a strainer basket is not employed, the weir can also be adapted to seat on a peripheral ledge or lip in the tank. Alternatively, the periphery of the tank outlet port can also serve as a seat for the weir, when a strainer basket is not used.

To prevent overheating and damage to the

circulation system pump when the weir is in the closed position, the pump can be provided with a by-pass loop with the appropriate valving adapted to open when the suction line pressure is reduced to a predetermined limit. It is usually preferable, however to provide a by-pass line as an integral part of the skimmer to maintain pool water circulation when the water level is reduced. Accordingly, a by-pass line communicating the swimming pool at a point below the surface and the skimmer tank downstream of the weir shut-off seat can be provided. The by-pass line can be fitted with a manual shut-off valve, so that the flow entering via the weir and the by-pass line can be balanced. Instead of a manual valve or in conjunction therewith a normally closed check valve can be disposed in the by-pass line, so that under normal pool level conditions all skimmer flow enters the tank via the weir. The check valve is responsive to the differential pressure thereacross, and can be set to open simultaneously with the closing of the weir so that there is no discontinuance of water circulation.

The by-pass line can be connected to a low point at the bottom of the pool and can thereby serve as a main drain. It can also be connected to any point below the surface to serve merely as an equalizer line to feed water to the circulation system when the pool level is reduced. In addition, it is often desirable to provide both an equalizer line and a main drain line. The skimmer of the present invention can be easily adapted to receive both.

In either case as another preferred feature of the invention the by-pass line or lines can be and preferably are positioned in the tank so that by-pass flow will also pass through the strainer basket. This is important to prevent large particles from entering the water circulation pump, particularly during vacuuming of the pool bottom as is described hereinafter. Such pumps are equipped with protective strainers, but the pump must be stopped in order to clean the strainer. The strainer basket in the skimmer on the other hand can be removed for cleaning without disturbing water circulation.

When the weir is adapted to seal against a ledge in the tank separating the inlet passage and the basket cavity, the by-pass line can be positioned below the ledge and above the basket so that by-pass flow will proceed through the open top of the basket. When the weir is adapted to seal directly on the top of the basket, the by-pass line can be positioned to abut the side of the basket. An opening provided in the basket adjacent the by-pass line permits the entry of by-pass flow into the basket. The space between the end of the by-pass line and the side of the basket need only be as small as the largest opening in the basket to prevent entry of undesirable particles into the system.

The by-pass line may also serve as a convenient means for connecting a vacuum hose used for the periodic cleaning of the pool bottom. If the by-pass flow passes through the strainer basket, large particles removed from the pool during the vacuuming operation will be retained by the basket rather than passing into the circulation system. To facilitate vacuum cleaning the check valve in the by-pass line can be adapted to be held in the open position by the end of the vacuum hose. In this manner the entire suction force of the circulation system can be directed toward the vacuuming operation, inasmuch as no suction force is required to open the check valve. Many types of check valves well known in the art, such as the poppet type, spool type and swing type can be employed for this purpose. It is preferred, however, that a swing type valve be utilized, since that type is most easily held in the open position.

In permanent below-ground pools, suitable niches are provided in one or more locations along the side of the pool in which skimmer assemblies can be installed. The necessary piping leading to and from the filtration system, which is usually located away from the pool, is laid below ground and is conveniently out of the way. The skimmer of the present invention is quite adaptable for this type of permanent installation.

However, the mounting of skimmer assemblies on above-ground pools having a vinyl liner or the like presents a more difficult installation problem. The skimmer must be rigidly mounted on and extend through an opening in a wall of the pool in a leak proof manner. This is usually accomplished by utilizing a complete skimmer tank on the outside of the wall and a face plate on the inside, with appropriate gaskets interposed therebetween. By bolting the face plate to the skimmer tank through the wall, the tank is secured in a leakproof manner. In cutting the opening in the wall of the pool to accept the skimmer, extreme care must be employed to avoid tearing or making the opening in the vinyl liner too large, for if such a mistake occurs the liner is virtually destroyed, since repair is quite difficult. Accordingly, these considerations have been a strong deterrent to the installation of many swimming pool convenience components, such as underwater lights, because such components have required the cutting of additional openings in the pool walls. The do-it-yourselfer is particularly discouraged, since he wants to avoid the possible expense of replacing the liner. Furthermore, in addition to doing without the convenience components commonly found in below-ground

pools, the above ground pool owner has also been unable to utilize a skimmer having a by-pass line because such lines have communicated with the pool at a point remote from the skimmer, thus requiring an additional opening in the liner.

To avoid these difficulties, to reduce the cost of manufacturing and permit the installation of any number of components on an above-ground pool, it is another feature of the invention to provide a mounting face plate for the skimmer having integral mounting means for other swimming pool components, such as a return line outlet from the circulation system to the pool and an underwater light. This reduces the number of openings required in the pool to one, since all components are disposed in a single location in the wall of the pool. In this manner, winterizing the pool and reassembling the pool in the spring are also simplified by the use of a single unit containing all components. In addition, the face plate of the skimmer can be readily moulded to include the necessary mounting configuration for the internal components of the skimmer tank, such as mounting means for the weir, a support for the strainer basket, an equalizer or other by-pass and mounting means for a check valve in the by-pass line.

The skimmer tank and the components thereof can be formed from any strong non-corrodable material. Metals such as aluminum, bronze, brass, zinc, cadmium-plated and zinc-plated steel, nickel, chromium, chrominum-plated steel and stainless steel, are suitable. However, plastic materials are preferred due to their low cost, light weight and mouldability.

Plastics such as ABS polymer, Celcon (Registered Trade Mark) (polycarbonate resin), Cellon (Registered Trade Mark) (cellulose acetate), Delrin (Registered Trade Mark) (polyoxymethylene), nylon and Teflon (Registered Trade Mark) (polytetrafluoroethylene) are particularly well suited for the formation of the tank, the face plate and mounting flange of the tank and for the component parts of the skimmer, such as the weir plate, the check valve, the skimmer basket, etc. Transparent or translucent plastic materials, such as polyethylene, polypropylene, polyvinylchloride, and Lexan (Registered Trade Mark) (polycarbonate resin) can also be employed.

Several embodiments of the invention will be described by way of Example with reference to the accompanying drawings, in which:

Figure 1 is a cross-sectional view of one embodiment of the skimmer embodying the invention with an equalizer line;

Figure 2 is a partial cross-sectional view showing a vacuum hose installed in the equalizer line of the skimmer of Figure 1;

Figure 3 is a front view of the skimmer of Figure 1 shown installed in the side of an above-ground swimming pool;

Figure 4 is a cross-sectional view of a portion of the mounting means of the skimmer taken along the line 4—4 of Figure 3;

Figure 5 is a cross-sectional view of another skimmer embodying the invention including an underwater light and main drain connection;

Figure 6 is a cross-sectional view of another skimmer embodying the invention adapted for connection to a main drain of a swimming pool; and

Figure 7 is a top view of the main drain inlet to the skimmer of Fig. 6 showing a manually operable slide valve to adjust the main drain flow, taken along the line 7—7 of Figure 6.

The skimmer shown in Figures 1 to 4 comprises a tank 1 having an inlet passage 2 positioned so as to receive water 4 from the surface of a swimming pool, and an outlet 3 to discharge water to the suction side of a pump (not shown) for circulation through a water filtration system. The tank 1 has a lower cavity 5 in which is disposed a removable perforated or coarse screen strainer basket 6. The basket is supported by rim 17 which rests on ledge 21. The basket 6 removes and retains large particles of debris from the incoming water and thereby protects the pump.

A floating shut-off weir 8 is pivotally mounted in the inlet passage 2 and is responsive to the water level 10 in tank 1 to maintain a level in the tank which, for a given level in the inlet passage, is substantially constant thereby ensuring proper surface skimming action and to prevent water starvation of the pump when the water level in the pool is above the inlet passage 2. The weir 8 also serves as an automatic shut-off valve to close off the entrance to the lower cavity 5 when the water level in the pool drops below the inlet passage 2.

The weir 8 comprises a flat plate 9 extending substantially across the inlet passage 2 and hinged at the bottom to mounting means 11 formed on the face plate 12 of the tank 1. The weir is movable between floating and closed positions. A floatable material 13 such as foam rubber or plastics having a non porous rubber or plastics outer coating 14 is attached to the inner face of plate 9 to bias the weir toward the surface 10 of the water in the inlet passage 2, so that all flow normally entering the skimmer passes over the top edge 15 of the weir. The floatable material 13 and its non porous coating 14 also serve as a gasket to seal against the rim 17 of the basket 6 to close the lower cavity 5 of the tank 1 to prevent air intake when the pool water level drops below the opera-

tional limit of the weir, as shown by the dotted lines in Figure 1.

An equalizer line 7 formed as an integral part of the face plate 12 communicates the swimming pool at a point below the surface with the lower cavity 5 of the tank 1. A swing type check valve 18 pivotally mounted at its upper edge 20 normally closes the equalizer line to prevent by pass flow when the weir 8 is in a floating position. However, when the weir is in its closed position seated against rim 17 of the basket 6, the differential in pressure between the head of water in the pool above the equalizer line and the suction of the pump acts directly on the check valve 18 causing it to open, so that a sufficient amount of water to prevent starvation and damage to the pump is supplied via equalizer line 7. This allows continuous water circulation when the water level in the pool is below the operational limit of the weir 8.

To prevent damage to the pump by large particles which are drawn in via the equalizer line 7 particularly, during vacuum cleaning of the pool bottom, the equalizer line flow is directed through the strainer basket 6. This is accomplished by providing an opening 23 in the basket through which the equalizer flow may enter. The basket 6 is positioned in the tank 1 in a manner such that the opening 23 is aligned with the equalizer line. By maintaining the clearance basket abuts the end 25 of the equalizer line 7. The side 24 of the between the side 24 of the basket and the end 25 of the line 7 so that it is no greater than the largest opening in the basket 6, the passage of undesirable particles is effectively prevented. The opening 23 is sufficiently large to allow the check valve 18 to swing into the basket in its open position, as shown by the dotted line.

The equalizer line 7 is adapted to receive and hold the end of a pool vacuum cleaning hose 28 as shown in Figure 2 to facilitate periodic vacuuming of the pool bottom. The end of hose 28 holds the swing valve 18 in its open position, thus allowing the full suction force of the pump to be utilized for vacuuming. To commence vacuuming the weir is manually moved to its closed position so that the suction force is directed to the pool via the vacuum hose 28. The buoyancy of the weir can be made less than the suction force created by the pump in the lower cavity 5, so that the suction holds the weir in the closed position during the vacuuming operation. Alternative means for holding the weir closed during vacuuming are also available and are often preferable since the low buoyancy type weir requires manual resetting when the weir closes automatically due to reduced water level in the pool. A simple catch can be employed or a weight can be placed on the closed weir. Other means will be apparent to those skilled in the art.

Access to the interior of the tank is provided by a removable cover 30. Preferably the cover slides into place, rather than merely resting on the top of the tank, so that it cannot be accidently jostled. It is also preferable to form the cover 30 from a transparent plastic material. This permits inspection of the interior without removing the cover to determine whether the skimmer is operating properly and to determine when the basket 6 is filled with debris.

The face plate 12 of the tank 1 is formed with a fitting 31 for the return line 34 of the water circulation system. The fitting 31 is moulded as an integral part of the plate 12 and thus provides a low cost return line connection, without the necessity of providing an additional opening in the pool wall.

As shown in Figures 1, 3 and 4 the tank 1 is formed with a peripheral mounting flange 40. (Shown as a dotted line in Figure 3). The skimmer assembly is mounted on wall 35 of the pool with the tank on the exterior of the pool adjacent an opening in the wall. The face plate 12 has a matching flange 32 and is disposed on the inside of the pool abutting wall 35. A plurality of bolts 33 extending through wall 35 secure the flange 32 to the skimmer tank flange 40. The wall 35 shown in Figure 4 comprises a vinyl liner 37 and a supporting wall 38. To prevent leakage a gasket 36 is disposed between the flange 32 and the vinyl liner 37 and a gasket 39 is disposed between the wall 38 and the skimmer tank flange 40. The bolts 33 are secured in place by their engagement with threaded blind holes 41 formed in the tank flange 40.

In operation water normally enters the skimmer tank via inlet passage 2. The weir 8 floats on the surface of the water in the inlet passage and is responsive to the level therein, so that the water level in the tank remains relatively constant for any given pump flow rate. Since the weir permits only surface water to enter the tank, floating debris is effectively drawn into the skimmer thus cleaning the pool surface. The water proceeds through strainer basket 6 which removes and retains large particles, and then passes into the water circulation and filtration system via outlet 3. Clean water is then returned to the pool from the circulation system by means of return line 34.

If the water level in the pool is reduced below the inlet passage 2, the pump tends to drain all the water from the tank 1. However, when the water level in the tank drops below the operational limit of the weir 8, the weir automatically seats against the rim 17 of the basket 6 to close off the lower cavity 5 of the tank. This prevents air from being

drawn into the system. Upon the closing of the weir a differential pressure is created across the check valve 18, which causes it to open. Water then enters via equalizer line 7 to maintain continuous water circulation. When water is added to the pool so that the level is again raised above the inlet passage 2, the buoyancy of the weir causes it to lift off the rim 17 and open the lower cavity of the tank. This reduces the differential pressure across the check valve 18 which then closes. Normal operation of the skimmer then commences.

The skimmer assembly shown in Figure 5 differs from the embodiment described above in that the weir 8 is adapted to seat against a ledge 42 formed in the tank 1, and the equalizer line 7 communicates with the tank 1 at a point between the shut-off seat 42 for the weir and the top of the strainer basket 6. This eliminates the need for an equalizer flow opening in the basket. In addition a main drain connection 45 is also provided in tank 1 above the basket. The main drain line has a slide valve 46 to permit manual adjustment of the amount of flow entering via the drain line. The operation of the slide valve is described with regard to Figure 7. The operation of this embodiment is the same as that described above.

The skimmer assembly of Figure 5 also includes means for mounting an underwater light 44 in the wall 35 of the pool. The face plate 12 is provided with an opening 48 in which the light 44 can be installed. A recess 63 in the plate 12 along the periphery of opening 48 receives and holds a corresponding flange 47 formed on the light 44 and a gasket 62. The flange 47 together with a second gasket 60 is clamped between the plate 12 and mounting rim 61, and is thereby secured in a leakproof manner. The flange 32 on the plate 12 is bolted to flange 40 on the tank 1 through wall 35 as described above.

In the embodiment of the skimmer assembly shown in Figure 6 a main drain connection 45 to the pool bottom is provided in lieu of an equalizer line. The main drain connection extends into the interior of the strainer basket 6 through opening 50 formed in the bottom of the basket. In this manner large particles of debris entering the skimmer via the main drain line are trapped in the basket.

A manually operable pivoted slide valve 46 as shown in Figure 7 is provided to permit adjustment of the flow balance between the flow entering over the weir 8 and the flow entering via drain line 45. When the weir 8 is in the closed position water proceeds to the pump via the main drain line to maintain continuous circulation. The valve 46 can also be adapted to serve as a check valve by providing a telescoping stem at the pivot point which permits the valve to lift when a sufficient differential pressure acts upon it. In this manner the drain line can be closed during normal operation and will automatically open to provide the required flow when the pool level drops below the inlet passage.

In addition, in the embodiment of Figure 6 the weir 8 has a non-resilient floatable material 71 attached thereto and is adapted to seal upon a resilient gasket 70 disposed on the rim 17 of the basket 6.

It should be noted that although the skimmer and shut-off weir of the invention is primarily adapted for use on swimming pools, its use is not limited to swimming pools. It could be employed on any fluid containing vessel, in which the surface fluid is drawn off and recirculated, and in which induction of air into the circulating system is to be avoided. This is quite common in the chemical and petroleum processing industry.

My co-pending Application No. 18230/74 (Serial No. 1,372,880), which is divided from this application, contains claims to a swimming pool skimmer having an inlet shut-off valve and a by-pass line which is integral with a face plate for the mounting of the skimmer tank and discharges into a strainer basket in the tank.

WHAT I CLAIM IS:—

1. A tank through which in use liquid is led off from a liquid containing reservoir, having an inlet for liquid from the reservoir, an outlet and a shut-off weir comprising a member floatable in the liquid and pivotally mounted on a horizontal axis for flow of liquid from the inlet over an edge of the weir remote from the axis and responsive to the level of liquid in the tank by pivoting to maintain a level in the tank which is substantially constant for a given liquid level of the reservoir when the level in the reservoir is above a pre-determined level, and to automatically seal against a valve seat in the tank to prevent flow through the tank from the inlet to the outlet when the reservoir level is below the said predetermined level.

2. A tank in accordance with claim 1 wherein the said pre-determined level is the level of the inlet passage.

3. A tank in accordance with claim 1 or 2 in which the member is a plate which extends substantially across the tank inlet passage, is hinged at its lower edge on said horizontal axis, and is movable between floating and closed positions; and floatable gasket material is attached to the face of the plate towards the tank to bias the plate toward the surface of the liquid in the inlet passage in a floating position when the reservoir level

is above the said pre-determined level and to seal against the valve seat in the tank in the closed position.

4. A swimming pool skimmer comprising, in combination, a tank having an inlet passage to receive water and floating debris from the surface of a swimming pool and an outlet to discharge such water; a shut-off valve seat in the tank between the inlet passage and the outlet; and a shut-off weir comprising a plate floatable in the water pivotally mounted on a horizontal axis for flow of water from the inlet over an edge remote from the axis into the tank and responsive to the level of water in the tank by pivoting to maintain a level of water in the tank which is substantially constant for a given level of the pool when the level in the pool is above the inlet passage and to automatically seal against the shut-off valve seat to prevent flow through the tank from the inlet to the outlet when the water level in the pool is below the inlet passage.

5. A skimmer in accordance with claim 4, in which the shut-off weir comprises a flat plate extending substantially across the inlet passage of the tank, hinged at its lower edge on said horizontal axis and movable between floating and closed positions; and floatable gasket material attached to the inner face of the plate to bias the plate toward the surface of the water in the inlet passage in a floating position under normal pool level conditions, and to seal against the shut-off valve seat in the tank in the closed position.

6. A skimmer in accordance with claim 4 or 5, further comprising a by-pass line adapted to communicate the swimming pool at a point below the water surface thereof and the tank downstream of the shut-off valve seat, to maintain water circulation when the weir is in the closed position.

7. A skimmer in accordance with claim 6, in which a removable strainer basket is disposed in the tank in the line of flow from both the inlet passage and the by-pass line to the outlet, to remove and trap debris from the incoming water whether the weir is in its normal operating position or its closed position.

8. A skimmer in accordance with claim 6 or 7, in which a normally closed check valve is disposed in the by-pass line and adapted to open in response to a predetermined increase in differential pressure thereacross created when the weir is in the closed position.

9. A skimmer in accordance with claim 8, in which the by-pass line is adapted to receive a vacuum cleaning hose, and the check valve is adapted to be held in an open position by the end of the vacuum cleaning hose.

10. A skimmer in accordance with claim 8 or 9, in which the check valve is of the swing type hinge mounted at its upper edge at the inner end of the by-pass line.

11. A skimmer in accordance with any one of claims 3 to 7, in which a manually operable shut-off valve is disposed in the by-pass line.

12. A swimming pool skimmer comprising, in combination, a tank having an inlet passage to receive water and floating debris from the surface of a swimming pool, an outlet to discharge such water and a by-pass line positioned below the inlet passage and adapted to communicate the tank and the swimming pool at a point below the water surface, a removable strainer basket disposed in the tank in the line of flow from the inlet passage to the outlet to remove and trap debris having an open top portion communicating with the inlet passage, a peripheral rim at the edge of the open top portion for supporting the basket in the tank at a point below the inlet passage, and a by-pass opening in a side thereof adjacent the inner end of the by-pass line to communicate the interior of the basket and said by-pass line, the end of said by-pass line abutting or being adjacent the basket around said opening; a shut-off weir comprising a plate floatable in the water pivotally mounted on a horizontal axis for flow of water from the inlet passage over an edge remote from the axis into the tank and responsive to the level of water therein to maintain, for a given level in the pool, a substantially constant water level in the tank when the water level in the pool is above the inlet passage, and to automatically seal against the rim of the strainer basket to prevent flow through the tank from the inlet passage to the outlet when the water level in the pool is below the level of the inlet passage; and a normally closed check valve disposed in the by-pass line and adapted to open in response to a predetermined increase in differential pressure thereacross created when the weir is in the closed position, to maintain continuous water flow via the opening in the side of the skimmer basket during fluctuations in the pool water level.

13. A swimming pool skimmer comprising, in combination, a tank having an inlet passage to receive water and floating debris from the surface of the swimming pool, an outlet to discharge such water, a by-pass line positioned below the inlet passage and adapted to communicate the interior of the tank and the swimming pool at a point below the water surface; a removable strainer basket disposed in the tank in the line of flow from the inlet passage and the by-pass line to the outlet to remove and trap debris and having an open top portion for receiving water, and means for supporting the basket in the tank at a point below the inlet pas-

sage; a shut-off weir comprising a plate floatable in the water and pivotally mounted on a horizontal axis for flow of water from the inlet passage over the edge of the weir remote from the axis and responsive to the level of liquid in the tank by pivoting to maintain a level in the tank which is substantially constant for a given water level in the pool and to automatically seal against a valve seat in the tank to prevent flow through the tank from the inlet passage to the outlet when the water level in the pool drops below the level of the inlet passage; and a normally closed check valve pivotally disposed at the inner end of the by-pass line and adapted to open in response to a predetermined increase in differential pressure thereacross created when the shut-off weir is in the closed position to maintain continuous water circulation via the skimmer basket during fluctuations in the pool water level.

14. A skimmer in accordance with claim 13, in which the removable strainer basket includes an opening in the side thereof adjacent to the inner end of the by-pass line to communicate the interior of the basket and said by-pass line; said check valve being adapted to open into the side opening of said strainer basket; and said shut-off weir being adapted to seal against and close the open top portion of the basket in the closed position.

15. A skimmer in accordance with any one of claims 12 to 14, in which the by-pass line is adapted to receive a vacuum cleaning hose, and the check valve is adapted to be held in an open position by the end of the vacuum cleaning hose.

16. A skimmer in accordance with any one of claims 12 to 15 in which the check valve is of the swing type hingeably mounted at its upper edge at the inner end of the by-pass line and adapted to pivotally move through the opening in the side of the skimmer basket in its open position.

17. A skimmer for a swimming pool substantially as herein described with reference to, and as shown in, Figures 1 to 4, 5 or 6 and 7 of the accompanying drawings.

18. A swimming pool having a skimmer according to any one of the preceding claims.

MEWBURN ELLIS & CO.,
Chartered Patent Agents,
70—72 Chancery Lane,
London, WC2A 1AD.
Agents for the Applicant.

Printed for Her Majesty's Stationery Office by Burgess & Son (Abingdon), Ltd.—1974.
Published at The Patent Office, 25 Southampton Buildings, London, WC2A 1AY,
from which copies may be obtained.

1372879 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

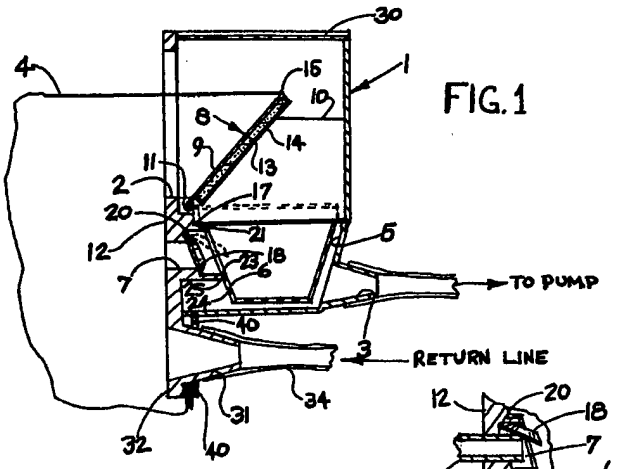

FIG. 1

FIG. 2

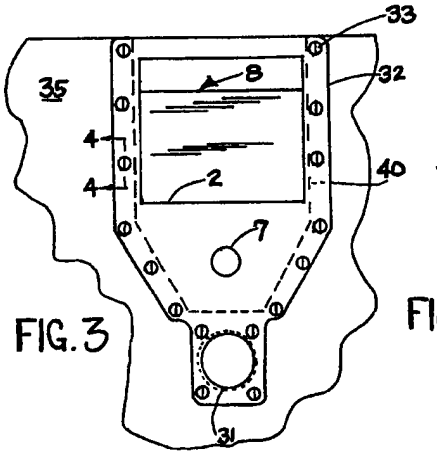

FIG. 3

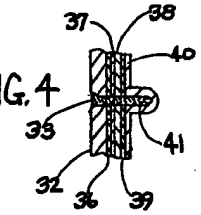

FIG. 4

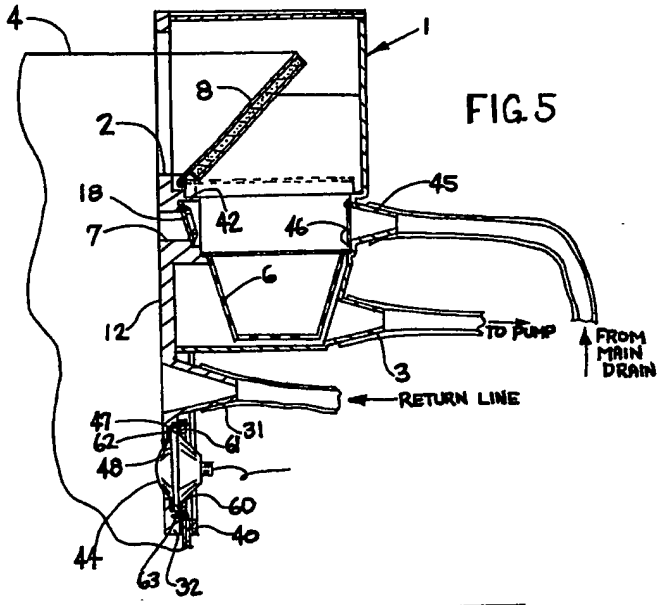

FIG. 5

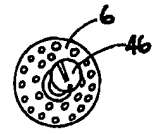

FIG. 7

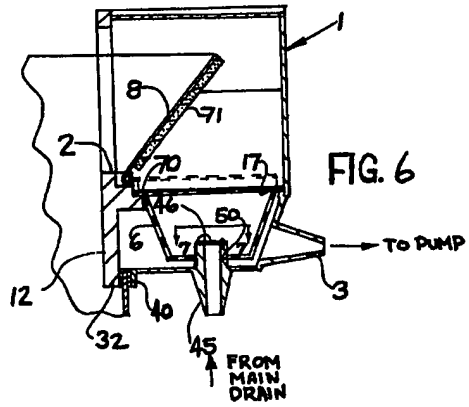

FIG. 6